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EXAMINER	
CHOJNACKI, MELLISSA M	

ART UNIT	PAPER NUMBER
2164	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/079,458	MICKA, WILLIAM FRANK	
	Examiner	Art Unit	
	Mellissa M Chojnacki	2164	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 October 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,13-28,30-34,36-46 and 48-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,13-28,30-34, 36-46 and 48-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

SAM RIMELL
PRIMARY EXAMINER

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Remarks

1. In response to communications filed on October 28, 2004, claims 1-11,13-28,30-34, 36-46 and 48-52 have been amended, 12, 29, 35 and 47 are cancelled, new claims 53-56 are added per applicant's request, therefore claims 1-11,13-28, 30-34, 36-46 and 48-56 are presently pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-11,13-28, 30-34, 36-46 and 48-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (U.S. Patent No. 6,446,176) in view of Milillo et al. (U.S. Patent No. 6,643,671).

As to claim 1, West et al. teaches a method for synchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link (See abstract, where "databases" is read on "storage ").

West et al. does not teach destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to

be overwritten with the modified data; performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume at the remote site for the current database update; synchronizing the second volume at the primary site with the third volume at the remote site for the current database update by transmitting the modified data of the second volume to the third volume as indicated by the one or more bits in the second bitmap; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

Milillo et al. teaches a system and method for synchronizing a data copy using an accumulation remote copy trio consistency group (See abstract), in which he teaches

(a) destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data (See column 2, lines 44-53, lines 58-67);

(b) performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume at the remote site for the current database update (See column 4, lines 47-60; column 8, lines 42-60); and

(c) synchronizing the second volume at the primary site with the third volume at the remote site for the current database update by transmitting the modified data of the

second volume to the third volume as indicated by the one or more bits in the second bitmap (See column 2, lines 43-67; column 4, lines 47-60), and

(d) performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site (See column 2, lines 7-14; column 3, lines 1-33).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified West et al., to include destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data; performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume at the remote site for the current database update; synchronizing the second volume at the primary site with the third volume at the remote site for the current database update by transmitting the modified data of the second volume to the third volume as indicated by the one or more bits in the second bitmap; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified West et al., by the teachings of Milillo et al. because destaging modified data to a first volume at the primary site for a current

database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data; performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume at the remote site for the current database update; synchronizing the second volume at the primary site with the third volume at the remote site for the current database update by transmitting the modified data of the second volume to the third volume as indicated by the one or more bits in the second bitmap; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site would migrate data to a secondary storage system having multiple volumes for disaster recovery purposes much quicker to facilitate smaller incremental backups (See Milillo et al., column 3, lines 19-28).

As to claims 2, 19 and 37 West et al. as modified, teaches wherein the first bitmap represents a FlashCopy bitmap and the second bitmap represents a peer-to-peer remote copy (PPRC) bitmap (See Milillo et al., column 1, lines 13-20; column 2, lines 44-50, where "FlashCopy" is read on "snapshot").

As to claims 3, 20 and 38, West et al. as modified, teaches wherein the first point in time virtual copy is achieved by flashcopying the modified data of the first volume to

the second volume (See Milillo et al., column 2, lines 44-50; column 3, lines 21-30; column 7, lines 66-67; column 8, lines 1-9; column 9, lines 24-34).

As to claims 4, 21 and 39, West et al. as modified, teaches wherein the step of flashcopying initializes the one or more bits in the first bitmap (See Milillo et al., column 2, lines 44-53, where "flashcopying" is read on "snapshot copy"; column 4, lines 47-60).

As to claims 5, 22 and 40, West et al. as modified, teaches wherein the second point in time virtual copy is archived by flashcopying the modified data of the third volume at the fourth volume (See Milillo et al., column 2, lines 44-53, where "flashcopying" is read on "snapshot copy"; column 4, lines 47-60; column 8, lines 29-60).

As to claims 6, 23 and 41, West et al. as modified, teaches further comprising providing an application host that is associated with the first volume for performing the one or more incremental database updates (See West et al. abstract; column 1, lines 45-52; column 1, lines 58-67; column 2, lines 1-2, lines 17-24; also see Milillo et al., column 1, lines 56-67; column 2, lines 1-6); further comprising an application host that is associated with the first volume for performing the one or more incremental database updates (See West et al. abstract; column 1, lines 45-52; column 1, lines 58-67; column 2, lines 1-2, lines 17-24; also see Milillo et al., column 1, lines 56-67; column 2, lines 1-6).

As to claims 7, 24 and 42, West et al. as modified, teaches further comprising a staggering the one or more incremental database updates during the current database update (See West et al. column 9, lines 48-61; also see Milillo et al., column 9, lines 24-47); further comprising a means for staggering the one or more incremental database updates during the current database update (See West et al. column 9, lines 48-61; also see Milillo et al., column 9, lines 24-47).

As to claims 8, 25 and 43, West et al. as modified, teaches wherein staggering comprises:

determining whether a synchronization for a previous database update is complete after the destaging is preformed for the current database update (See West et al., column 9, lines 39-42); and

waiting for the synchronization of the previous database update to complete before the performing the first point in time virtual copy for the current database update (See West et al., column 9, lines 39-42; also see Milillo et al., column 1, lines 56-67; column 2, lines 1-6);

wherein the means for staggering determines whether a synchronization for a previous database update is complete after the destaging is performed for the current database update (See West et al., column 9, lines 39-42); and

waits for the synchronization of the previous database update to complete before the transferring of the first bitmap to the second bitmap for the current database

update (See West et al., column 9, lines 39-42; also see Milillo et al., column 1, lines 56-67; column 2, lines 1-6).

As to claims 9, 26 and 44, West et al. as modified, teaches wherein staggering further comprises:

initializing the first bitmap for a next database update after the performing the first point in time virtual copy for the current database update (See Milillo et al., column 2, lines 44-53; column 4, lines 47-60; column 8, lines 42-60, where "flashcopying" is read on "snapshot copying");and

waiting for the next database update after the synchronizing for the current database update (See West et al., column 9, lines 39-42);

wherein the means for staggering initializes the first bitmap for a next database update after the first means performs the point in time virtual copy for the current database update (See Milillo et al., column 2, lines 44-53; column 4, lines 47-60; column 8, lines 42-60, where "flashcopying" is read on "snapshot copying"); and

waits for the next database update after the means for synchronizing

synchronizes the second volume with the third volume for the current database update (See West et al., column 9, lines 39-42).

As to claims 10, 27 and 45, West et al. as modified, teaches wherein the synchronizing is achieved by establishing a peer to peer remote copy session between

the second volume and the third volume for physically transmitting the modified data of the second volume over the at least one communication link to the third volume (See West et al., column 1, lines 10-15; column 2, lines 49-67; column 9, lines 43-61; also see Milillo et al., column 1, lines 35-48, lines 56-67; column 2, lines 1-6); wherein the means for synchronizing establishes a peer to peer remote copy session between the second volume and the third volume for physically transmitting the modified data of the second volume over the at least one communication link to the third volume (See West et al., column 1, lines 10-15; column 2, lines 49-67; column 9, lines 43-61; also see Milillo et al., column 1, lines 35-48, lines 56-67; column 2, lines 1-6).

As to claims 11, 28 and 46, West et al. as modified, teaches further comprising a providing a controller at the primary site for managing access to both the first volume and the second volume (See West et al., column 4, lines 47-62; column 5, lines 7-14; also see Milillo et al., column 3, lines 35-49; column 6, lines 53-67); and providing a controller at the remote site for managing access to the third volume and the fourth volume (See West et al., column 4, lines 47-62, where "adapter" is read on "interface"; column 5, lines 7-14; also see Milillo et al., column 3, lines 35-49; column 6, lines 53-67); further comprising means for managing access to both the first volume and the second volume (See West et al., column 4, lines 47-62, where "adapter" is read on "interface"; column 5, lines 7-14; also see Milillo et al., column 3, lines 35-49; column 6, lines 53-67); and means for managing access to the third volume and the forth volume

(See West et al., column 4, lines 47-62, where "adapter" is read on "interface"; column 5, lines 7-14; also see Milillo et al., column 3, lines 35-49; column 6, lines 53-67).

As to claims 13, 30 and 48, West et al. as modified, teaches further comprising:

initializing the first bitmap to indicate that all data on the first volume is to be copied to the second volume and all data that is copied to the second volume is to be copied to the third volume (See Milillo et al., column 2, lines 44-53, lines 58-63; column 4, lines 47-60; column 8, lines 42-60); further comprising:

means for initializing the first bitmap to indicate that all data of the first volume is to be copied to the second volume and all data that is copied to the second volume is to be copied to the third volume (See Milillo et al., column 2, lines 44-53, lines 58-63; column 4, lines 47-60; column 8, lines 42-60);

As to claims 14, 31 and 49, West et al. as modified, teaches further comprising providing a recovery host that is associated with the forth volume for recovering from a failure of the primary site by providing access to the forth volume (See West et al., column 1, lines 38-44; also see Milillo et al., column 8, lines 42-67, where "recovery host" is read on "recovery operation"; column 10, lines 38-54).

As to claims 15, 32 and 50, West et al. as modified, teaches further comprising automatically initiating the incremental database updates (See Milillo et al., column 15,

lines 20-23); the system further comprising a means for automatically initiating the incremental database updates (See Milillo et al., column 15, lines 20-23).

As to claims 16, 33 and 51, West et al. as modified, teaches wherein destaging further comprises:

inspecting the one or more bits of the first bitmap at the primary site to determine whether the second volume includes data of the one or more tracks on the first volume that are to be overwritten with the modified data (See Milillo et al., column 2, lines 44-53, lines 58-67); and

performing a point in time virtual copy from the first volume to the second volume of the data of the one or more tracks on the first volume that are to be overwritten with the modified data if the first bitmap indicates that the second volume does not include the data of the one or more tracks on the first volume that are to be overwritten with the modified data (See Milillo et al., column 2, lines 44-53; column 4, lines 47-60);

wherein the means for destaging further compromises:

means for inspecting the one or more bits of the first bitmap at the primary site to determine whether the second volume includes data of the one or more tracks on the first volume that are to be overwritten with the modified data (See Milillo et al., column 2, lines 44-53, lines 58-67); and

means for performing a point in time virtual copy from the first volume to the second volume of the data of the one or more tracks on the first volume that are to be overwritten with the modified data if the first bitmap indicates that the second volume

does not include the data of the one or more tracks on the first volume that are to be overwritten with the modified data (See Milillo et al., column 2, lines 44-53; column 4, lines 47-60).

As to claims 17, 34 and 52, West et al. as modified, teaches wherein the at least one communication link is comprises at least one of a channel link; a T1/T3 link; a Fibre channel; and an ESCON link (See West et al., column 4, lines 11-15; lines 56-60).

As to claim 18, West et al. teaches a system for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link (See abstract, where "databases" is read on "storage ").

West et al. does not teach means for destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data; first means for performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume which is at the remote site for the current database update; means for synchronizing the second volume with the third volume for the current database update by transmitting the modified data of the second volume to the third volume as indicated by the one or more bits in the second

bitmap; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

Milillo et al. teaches a system and method for synchronizing a data copy using an accumulation remote copy trio consistency group (See abstract), in which he teaches

means for destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data (See column 2, lines 44-53, lines 58-67);

first means for performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume which is at the remote site for the current database update (See column 4, lines 47-60; column 8, lines 42-60); and

means for synchronizing the second volume with the third volume for the current database update by transmitting the modified data of the second volume to the third volume as indicated by the one or more bits in the second bitmap (See column 2, lines 43-67; column 4, lines 47-60), and

performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site (See column 2, lines 7-14; column 3, lines 1-33).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified West et al., to include means for

destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data; first means for performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume which is at the remote site for the current database update; means for synchronizing the second volume with the third volume for the current database update by transmitting the modified data of the second volume to the third volume as indicated by the one or more bits in the second bitmap; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified West et al., by the teachings of Milillo et al. because means for destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data; first means for performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume which is at the remote site for the current database update; means for synchronizing the second volume with the third volume for

the current database update by transmitting the modified data of the second volume to the third volume as indicated by the one or more bits in the second bitmap; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site would migrate data to a secondary storage system having multiple volumes for disaster recovery purposes much quicker to facilitate smaller incremental backups (See Milillo et al., column 3, lines 19-28).

As to claim 36, West et al. teaches a program storage device, tangibly embodying a program of instructions executable by a machine to perform a method for asynchronously transmitting one or more incrernental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link (See abstract, where "databases" is read on "storage "; also see column 4, lines 51-62, lines 64-67; column 5, lines 1-3; It is inherent that "disks drives" require a "controller").

West et al. does not teach destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data; performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume at the remote site for the current database update; synchronizing the second volume at the primary site with the third volume at the

remote site for the current database update by transmitting the modified data of the second volume to the third volume as indicated by the one or more bits in the second bitmap; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

Milillo et al. teaches a system and method for synchronizing a data copy using an accumulation remote copy trio consistency group (See abstract), in which he teaches

(a) destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data (See column 2, lines 44-53, lines 58-67);

(b) performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume at the remote site for the current database update (See column 4, lines 47-60; column 8, lines 42-60); and

(c) synchronizing the second volume at the primary site with the third volume at the remote site for the current database update by transmitting the modified data of the second volume to the third volume as indicated by the one or more bits in the second bitmap (See column 2, lines 43-67; column 4, lines 47-60), and

(d) performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site (See column 2, lines 7-14; column 3, lines 1-33).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified West et al., to include destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data; performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume at the remote site for the current database update; synchronizing the second volume at the primary site with the third volume at the remote site for the current database update by transmitting the modified data of the second volume to the third volume as indicated by the one or more bits in the second bitmap; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified West et al., by the teachings of Milillo et al. because destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data; performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be

transmitted to a third volume at the remote site for the current database update; synchronizing the second volume at the primary site with the third volume at the remote site for the current database update by transmitting the modified data of the second volume to the third volume as indicated by the one or more bits in the second bitmap; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site would migrate data to a secondary storage system having multiple volumes for disaster recovery purposes much quicker to facilitate smaller incremental backups (See Milillo et al., column 3, lines 19-28).

As to claims 53-55, West et al. as modified, teaches wherein during the synchronizing, the first volume is accessible to a host at the primary site, and the four volume is accessible to a host at the remote site (See West et al. abstract; column 1, lines 45-52; column 1, lines 58-67; column 2, lines 1-2, lines 17-24; also see Milillo et al., column 1, lines 56-67; column 2, lines 1-6).

As to claim 56, West et al. teaches wherein during the synchronizing, the first volume is accessible to a host at the primary site, and the fourth volume is accessible to a host at the remote site (See abstract; column 1, lines 45-52; column 1, lines 58-67; column 2, lines 1-2, lines 17-24).

West et al. does not teach a method for backing up data from a primary site to a remote site comprising; (a) destaging modified data to a first volume at the primary site

for a current database update; (b) performing a first point in volume virtual copy of the modified data of the first volume to a second volume at the primary site; (c) synchronizing the second volume with a third volume at the remote site by transmitting the modified data of the second volume to the third volume; and (d) after completion of the synchronizing, performing a second point in time virtual copy of the modified data of the third volume to a fourth volume at the remote site; wherein. during the synchronizing, the first volume is accessible to a host at the primary site, and the fourth volume is accessible to a host at the remote site.

Milillo et al. teaches a system and method for synchronizing a data copy using an accumulation remote copy trio consistency group (See abstract), in which he teaches a method for backing up data from a primary site to a remote site (See column 2, lines 31-42) comprising;

(a) destaging modified data to a first volume at the primary site for a current database update (See column 2, lines 44-53, lines 58-67);

(b) performing a first point in volume virtual copy of the modified data of the first volume to a second volume at the primary site (See column 4, lines 47-60; column 8, lines 42-60); and

(c) synchronizing the second volume with a third volume at the remote site by transmitting the modified data of the second volume to the third volume (See column 2, lines 43-67; column 4, lines 47-60), and

(d) after completion of the synchronizing, performing a second point in time

virtual copy of the modified data of the third volume to a fourth volume at the remote site (See column 2, lines 7-14; column 3, lines 1-33);

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified West et al., to include a method for backing up data from a primary site to a remote site comprising; (a) destaging modified data to a first volume at the primary site for a current database update; (b) performing a first point in volume virtual copy of the modified data of the first volume to a second volume at the primary site; (c) synchronizing the second volume with a third volume at the remote site by transmitting the modified data of the second volume to the third volume; and (d) after completion of the synchronizing, performing a second point in time virtual copy of the modified data of the third volume to a fourth volume at the remote site; wherein. during the synchronizing, the first volume is accessible to a host at the primary site, and the fourth volume is accessible to a host at the remote site.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified West et al., by the teachings of Milillo et al. because a method for backing up data from a primary site to a remote site comprising; (a) destaging modified data to a first volume at the primary site for a current database update; (b) performing a first point in volume virtual copy of the modified data of the first volume to a second volume at the primary site; (c) synchronizing the second volume with a third volume at the remote site by transmitting the modified data of the second volume to the third volume; and (d) after completion of the synchronizing, performing a second point in time virtual copy of the modified data of the third volume to a fourth

volume at the remote site; wherein. during the synchronizing, the first volume is accessible to a host at the primary site, and the fourth volume is accessible to a host at the remote site would migrate data to a secondary storage system having multiple volumes for disaster recovery purposes much quicker to facilitate smaller incremental backups (See Milillo et al., column 3, lines 19-28).

Response to Arguments

4. Applicant's arguments filed on 28-October -2004, with respect to the rejected claims 1-35 have been fully considered but they are not found to be persuasive:

In response to applicants' arguments regarding independent claim 1, that West et al. fails to teach or suggest, "asynchronously transmitting database updates". West et al. teaches that not only the "return of status information" but also the "transfer of data" may occur asynchronously, and update to the database incorporates transferring data (See column 7, lines 38-39). West et al. teaches transferring data asynchronously between two volumes that are located on two separate storage devices.

In response to applicants' arguments regarding "Milillo et al. uses a trio of source volume, primary target volume and a secondary volume (fig. 2 and 4). There is not disclosure or suggestion of the use of four volumes as set forth in the applicant's claims". Milillo et al., discloses that "Thus it is apparent that there has been provided, in accordance with the present invention, an improved system and method for

synchronizing a remote data copy. While the present invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications, and variations will be apparent to those skilled in the art in light of the foregoing description" (See column 15, lines 24-31). It would be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention, such as adding a fourth volume.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mellissa M Chojnacki whose telephone number is (571) 272-4076. The examiner can normally be reached on 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici can be reached on (571) 272-4083. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 17, 2005
MMC

SAM RIMELL
PRIMARY EXAMINER